

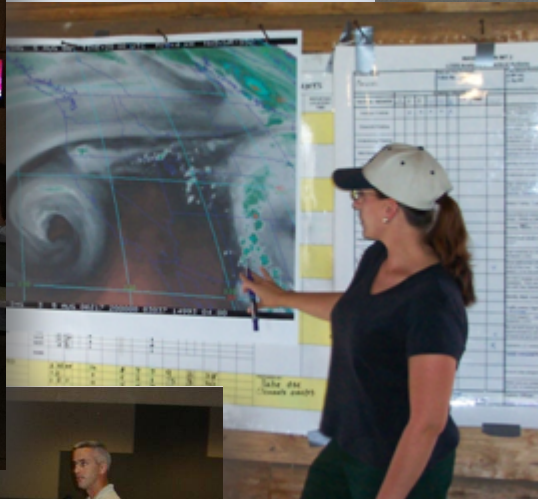


NOAA/NWS Operations Proving Ground

Preparing the NWS to Meet America's Growing Needs

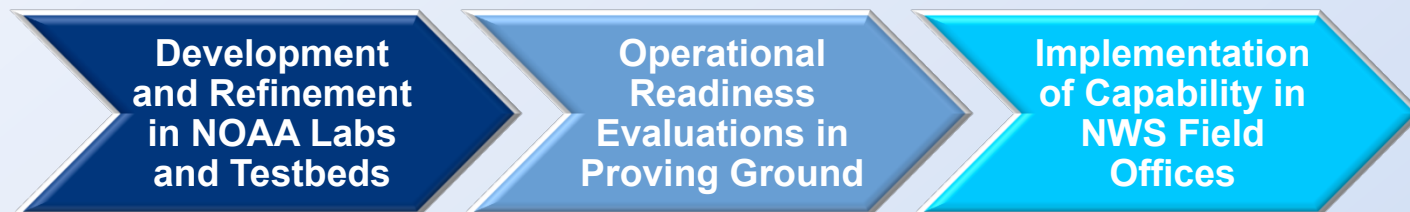
Kim Runk & Chad Gravelle
NOAA/NWS Training Center
Kansas City, Missouri

Prepare today's National Weather Service forecaster to support tomorrow's Weather Ready Nation by building capacity for superior impact-based decision support services.



Overview

- Streamlined R2O process and O2R feedback loop to optimize interaction between S&T development and NWS operations.
- Mechanism to evaluate human factor impacts, as well as technological ones, for any proposed new tools or service enhancement initiatives.
- Operational Readiness Evaluation (ORE) sessions will assess candidate capabilities in a realistic NWS operational setting.
- Prior to acceptance for ORE, candidate tools must have been rigorously assessed in a developmental testbed environment (e.g., HWT, HMT).



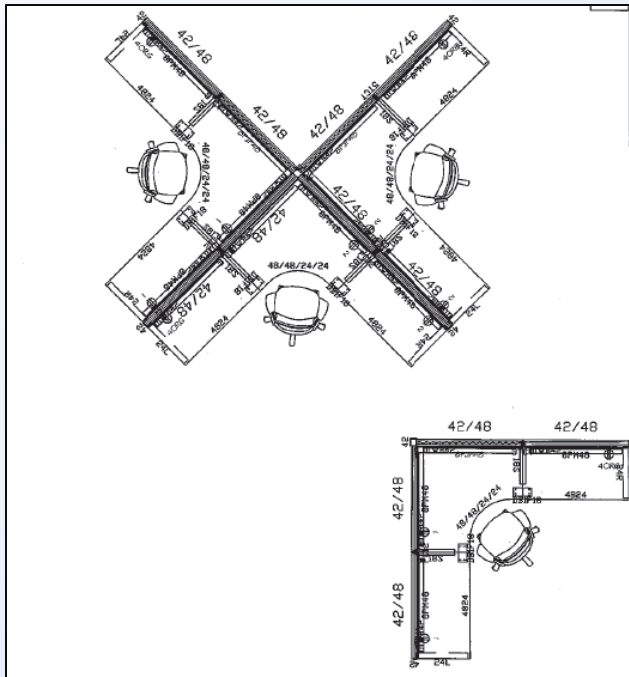
- **Candidate capabilities must successfully demonstrate substantive improvement to one or more of the following:**
 - *the warning and forecast process*
 - *collaborative decision making*
 - *risk communication*
 - *effective decision support services*
- **Candidate capability examples:**
 - *advanced observing systems*
 - *better use of data in decision making*
 - *improved forecast models, techniques*
 - *applications which enhance services*
 - *tools that promote benefits to public safety, disaster response, etc.*



- **Prototype 2-rack AWIPS; same performance capability through virtualized processing, lower hardware refresh costs.**
- **Experiment with cloud architecture to conduct thorough viability testing of processing, storage, scalability issues, as well as data integrity and IT security concerns.**

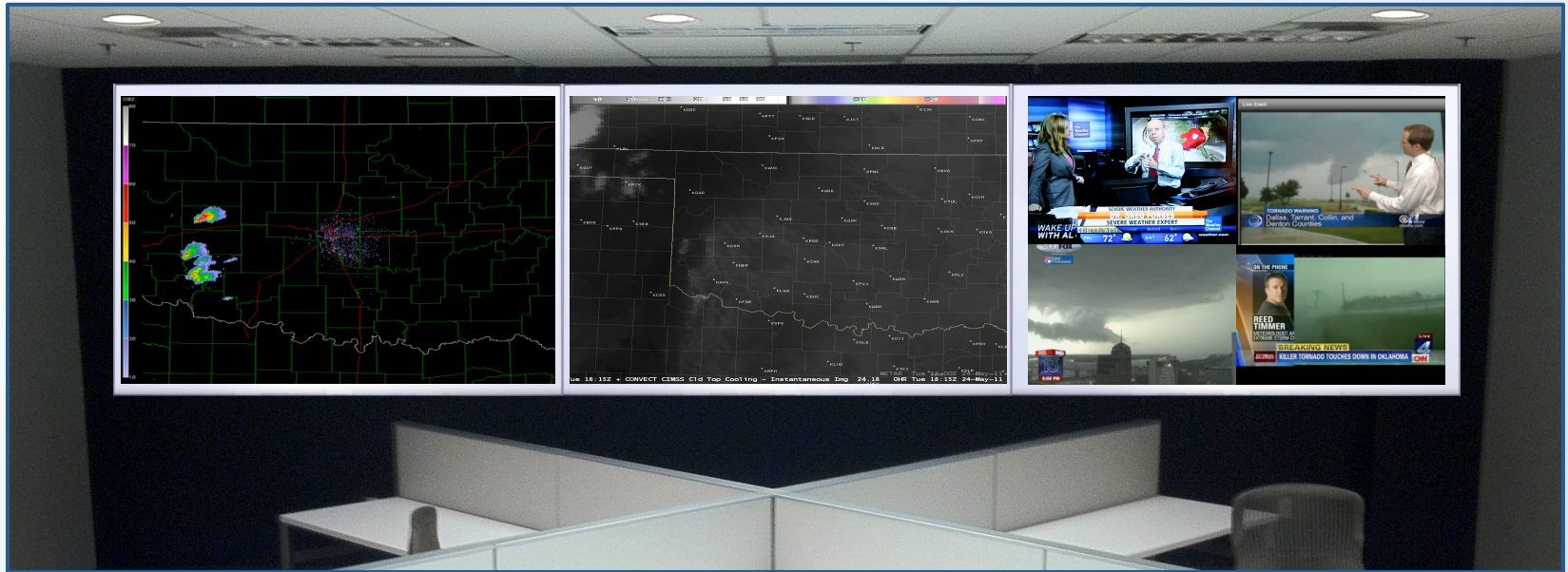


- **X-config designed to enhance collaborative interaction, maximize situational awareness**



- **Big picture SA, internal & external collaboration, tech support, etc., can be orchestrated from Event Coordinator position.**

Situational Awareness Wall



- **Three 70" High Def (1080p) LED-LCD displays**
 - *Center panel: touch-enabled, HD Interactive Smart Board*
 - *Side panels: Multi-source inputs; HD quad split capability*
 - *Side panels mounted with adjustable cantilevered arms*
 - *Controller unit and Media Center located at Coord Desk*
- **Commercial EVCM® GIS collaboration platform**

ORE Session Teams

- Eval Teams will be formed for all ORE Sessions.
- NWS forecasters, OPG facilitators, Core Partners (as appropriate), other relevant observers

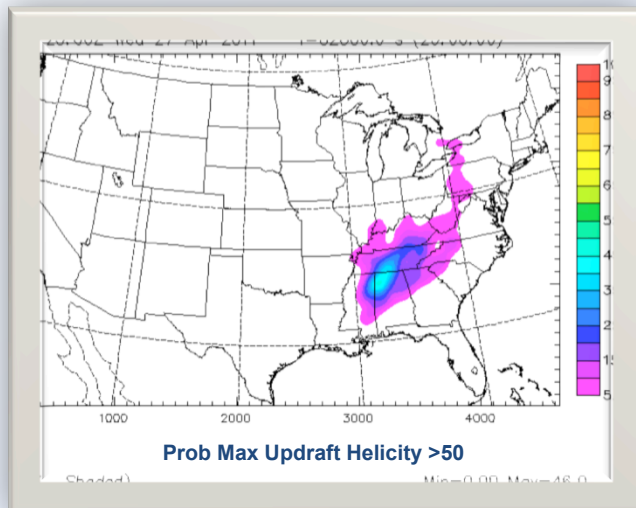


Involved ORE Session Example

Major Severe Weather Outbreak

Candidate Tools

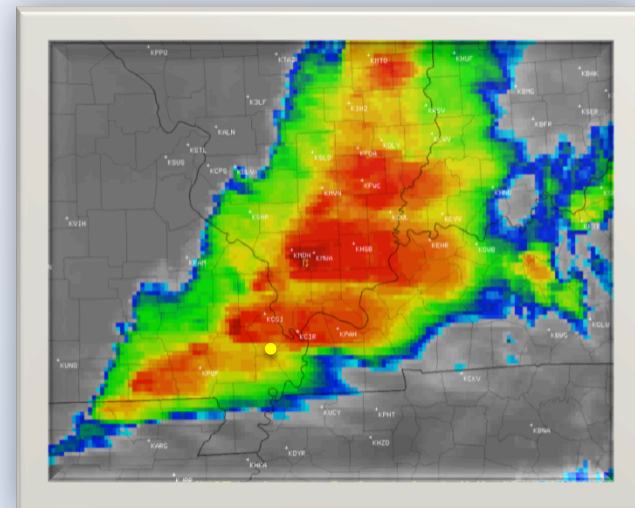
- **GOES-R Convective Products**
 - *cloud-top cooling / convective initiation*
 - *overshooting-top*
 - *thermal couplet / enhanced-V*
- **WRF/ARPS 50-member Ensemble**
- **EVCM Collaboration Platform**
- **Multimedia Weather Briefing**



WRF/ARPS 50-member Storm-Scale Ensemble 23h Fcst

Monday PM

- Familiarization with OPG systems and facilities
- Training on candidate tools
- Mini-cases using candidate tools



GOES-R Overshooting-Top Detection Algorithm

The image shows a typical office setting with multiple workstations. In the foreground, a woman with blonde hair wearing a red shirt sits at a desk with two monitors; one displays a web browser and the other a map. To her right, a man in a blue polo shirt and a white hard hat sits at another desk, looking towards the camera. A patterned bag sits on his desk. In the background, other employees are visible at their desks. Five speech bubbles are overlaid on the scene:

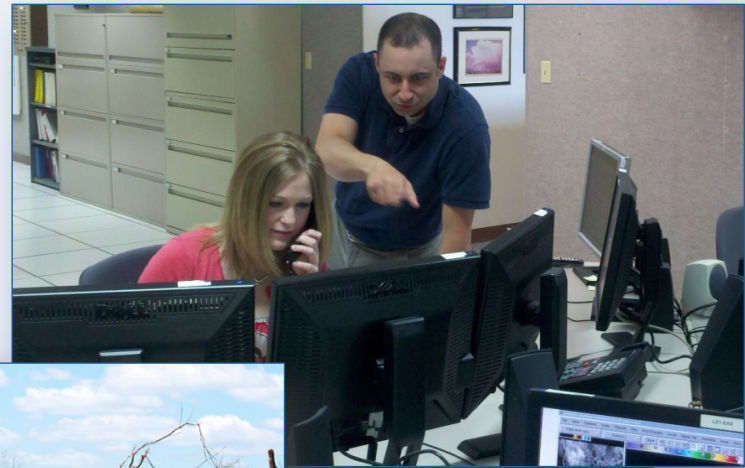
- Embezzle the snack fund profits for beer money, yes!*
- Yesterday I couldn't even spell fork aster. Today I are one.*
- A bubble containing complex mathematical formulas involving summations and fractions.
- I wish I had the rest of my luggage..*
- What do you mean the river moved?*

Involved ORE Session Example

Major Severe Weather Outbreak

THU: Two Days After – Full-Day ICS/EOC Simulation

- Facilitation shared by EM partners, ESF qualified officials
- On-site DSS / Risk Comm
 - Incident Commander IAP
 - Ops Crew Shift Changes
 - Aerial Recon, SAR Briefings
 - Press Conf, Media Interviews
 - Customized alert thresholds
- De-brief



Focused ORE Session Example

Impact-Based Warnings Experiment

- Varied environments, population density, convective modes
- Focus groups: NWS warning forecasters & select partners
- Assess decision making consistency and usefulness
- Determine effectiveness of risk communication, mitigation
- Evaluate use of information to perceive risk, act differently

Example Evaluation/Validation Questions

What factors led to your decision?

Can we account for differences?

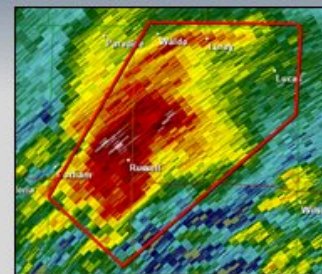
Did detailing expected impacts influence personal risk perception?

Did the stronger language lead to different actions?

What issues remain unresolved?



Impact Based Warnings Inaugural Tornado Warning



000
WFOSS WCT 141815
TORCOT
R0147-141845-
/O.NEW.KCTT.TO.W.0009.120414T1815Z-120414T1845Z/
BULLETIN - HAS ACTIVATION REQUESTED
TORNADO WARNING
NATIONAL WEATHER SERVICE WICHITA KS
115 PM CDT SAT APR 14 2012
THE NATIONAL WEATHER SERVICE IN WICHITA HAS ISSUED A
* TORNADO WARNING FOR...
RUSSSELL COUNTY IN CENTRAL KANSAS...
* UNTIL 145 PM CDT
* AT 110 PM CDT...A SEVERE THUNDERSTORM CAPABLE OF PRODUCING A
TORNADO WAS LOCATED 6 MILES SOUTHWEST OF RUSSSELL...AND MOVING
NORTHEAST AT 40 MPH.
HAZARD...DEVELOPING TORNADO AND QUARTER SIZE HAIL.
SOURCE...RADAR INDICATED ROTATION.
IMPACT...SIGNIFICANT HOUSE AND BUILDING DAMAGE POSSIBLE. MOBILE
HOMES COMPLETELY DESTROYED IF HIT. SOME TREES UPROOTED OR
SNAPPED. VEHICLES WILL LIKELY BE THROWN BY TORNADOIC WINDS.
* LOCATIONS IMPACTED INCLUDE...
RUSSSELL...BUNKER HILL...LUNAY...LOCAS...RUSSSELL AIRPORT...WILSON
LAKE AND WALDO.
THIS INCLUDES INTERSTATE 10 BETWEEN MILE MARKERS 177 AND 181.
PRECAUTIONARY/PREPAREDNESS ACTIONS...
TAKE COVER NOW. MOVE TO AN INTERIOR ROOM ON THE LOWEST FLOOR OF A
STURDY BUILDING. AVOID WINDOWS. IF IN A MOBILE HOME...A VEHICLE OR
OUTDOORS...MOVE TO THE CLOSEST SUBSTANTIAL SHELTER AND PROTECT
YOURSELF FROM FLYING DEBRIS.
HEAVY RAINFALL MAY HIDE THIS TORNADO. DO NOT WAIT TO SEE OR HEAR THE
TORNADO. TAKE COVER NOW.
**
LAT...LOW 3914 9852 3914 9849 3913 9848 3898 9849
3871 9857 3883 9904
TIME...MOT...LOC 18142 214603 20MT 2086 9807
TORNADO...RADAR INDICATED
SAL...1.018
**
BILLINGS



- Initial target: 3-4 formal ORE Sessions each year.
- Announcements of Opportunity issued to identify science and service areas of interest.
- Session summary reports highlight performance metrics, milestones achieved, recommendations concerning operational implementation.
- Full charter available on-line at:
www.testbeds.noaa.gov



Summary

- The Operations Proving Ground is one of ten key principles in the Weather Ready Nation Roadmap
- Formal readiness evaluations using NWS forecasters in a WFO setting will optimize transition of research to operations
- Initiatives aimed at enhancing expert IDSS provision, including partner facilitated incident simulations, can be tested and validated prior to implementation

